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THE NEW ENGLAND BOTANICAL CLUB

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THE VARIETIES OF CHIMAPHILA UMBELLATA.

S. F. Blake.

The common Pipsissewa or Wintergreen (*Chimaphila umbellata*) has long been regarded as a species of comparatively uniform characters and of a very wide range, including Eurasia from south-central Siberia to Norway, Germany, Austria, and Switzerland, the greater part of North America from New Brunswick and Quebec southward interruptedly to the mountains of Chiapas[1] and westward to the Pacific, and the Japanese Islands. It has also been recorded[2] recently from Santo Domingo, but the specimens from that island prove to represent a very distinct endemic species, which I have elsewhere described[3] as *Chimaphila domingensis*. Aside from an unsuccessful attempt by Alefeld[4] in 1856 to distinguish specifically between the plant of eastern North America and that of western North America and Europe, no division of the species had been proposed until very recently except by DeCandolle, who described the Mexican form as a variety in 1839. But when a large amount of material, representing nearly the whole range of the species, is examined, several rather marked and nearly constant differences appear between the plant of Eurasia and Japan on the one hand and the American forms on the other; and the latter, when carefully studied, prove to be divisible

[1] My reference of the plant to Guatemala, Journ. Bot. lii. 169 (1914) was apparently due to a slip of the pen, as I can find no record of specimens.

[2] Urb. Symb. Ant. v. 453 (1908).

[3] Blake, Journ. Bot. lii. 169 (1914). The record by Rydberg (N. Am. Fl. xxix. 31 (1914)), who recognizes *C. domingensis*, of *C. corymbosa* (= *C. umbellata*) from Santo Domingo is undoubtedly erroneous.

[4] Alefeld, Linn. xxviii. 78–84 (1856).

into at least four geographically isolated varieties. One of the differences between the American and European forms had been noted by J. E. Smith as long ago as 1814 ("1819"), in his revision of the genus for Rees's Encyclopaedia (xxix. no. 11), where he remarks, after describing *Pyrola umbellata:* "The American specimens are usually less umbellate, and more racemose, than the European."

In his recent revision of *Chimaphila* in the North American Flora,[1] Dr. Rydberg has restricted *C. umbellata* to Europe and divided the North American material hitherto referred to that species into four. One of these, *C. mexicana,* is the Mexican plant distinguished as a variety by DeCandolle in 1839. The eastern plant is called *C. corymbosa,* a name proposed by Pursh in 1814 as a new name for the transferred *Pyrola umbellata* of Linnaeus. A western plant, *C. occidentalis,* ranging from British Columbia to California, is described, and a southwestern one, *C. acuta,* from Arizona and New Mexico. Of the true *Chimaphila umbellata* Dr. Rydberg says:[2] "This is a European species with which our American species has been confused, differing from *C. corymbosa* in the smaller subovoid capsule, which is thicker below the middle, ovate sepals, longer than broad, shorter stamens, and obtusish leaf-blades. Alefeld, who distinguished the two, admitted *C. umbellata* to the west coast, but his specimens were evidently depauperate northern ones of *C. occidentalis.*" The diagnostic characters of the American representatives of *C. umbellata* are thus indicated in Dr. Rydberg's key.

Dilated portion of the filaments glabrous or merely ciliolate on the margin; leaves oblanceolate or spatulate, not mottled.
Sepals fully as broad as long, mostly obtuse.
Leaf-blades with rather indistinct lateral veins; pedicels ascending, not recurved; stem terete.....1. *C. occidentalis.*
Leaf-blades with more prominent lateral veins; pedicels in anthesis spreading, recurved; stem more or less round-angled.
Plant 1–2 dm. high; capsule 5–6 mm. in diameter.
Dilated portion of the filaments obovate, ciliolate; pedicels glandular-granuliferous.....2. *C. corymbosa.*
Dilated portion of the filaments ovate, not ciliolate; pedicels glabrous.....3. *C. domingensis.*
Plant 2–3 dm. high; capsule nearly 1 cm. in diameter.
4. *C. mexicana.*
Sepals longer than broad, acute.....5. *C. acuta.*

While the differential characters brought out in this key are confirmed for the most part by the abundant material examined, their

[1] Rydb. in Britton, N. Am. Fl. xxix. 30–32 (1914).
[2] Rydb. l. c. 32.

true value and the relationship of the plants concerned are considerably obscured by a treatment which ranks all of these as species. Thus *C. domingensis*, whose presence so far from the normal range of the genus may be compared with that of the remarkable Crossbill[1] recently discovered in the mountains of the same island, is sharply separated from all the other plants of this group by its ovate glabrous filaments, its perfectly glabrous peduncles and pedicels, very small and bluntly few-toothed leaves, and finely erose but scarcely glandular-ciliolate sepals. On the other hand, the plants called by Rydberg *C. umbellata*, *C. occidentalis*, *C. corymbosa*, *C. mexicana*, and *C. acuta* agree in the possession of obovate ciliolate filaments, densely glandular-granular peduncles and pedicels, larger more or less sharply toothed leaves, and ciliolate sepals; while the differential characters brought forward for their specific separation are confined to differences in size, in the prominence of the venation, the shape of the sepals, the direction of the pedicels, and the rotundity of the stem, characters which are not only rather obscure but at best are merely comparative, and are shown by the material examined to be by no means absolutely constant. Thus the venation in the leaves of western specimens of *C. umbellata* is sometimes although rarely nearly or quite as prominent as in eastern plants, while the shape of the stem, in herbarium specimens at least, is not to be depended upon to distinguish specimens from the two areas; and the character of the pedicels, whether ascending or spreading, is a feature not without variation in both forms. Both the eastern and western forms of the United States not infrequently attain the dimensions assigned to the Mexican form. The fruits of the Mexican specimens examined measure 7.5–8.5 mm. in diameter, none of them being "nearly 1 cm." thick, while in some of the western examples (*C. occidentalis*) capsules 7.5 mm. in diameter are found. In seven sheets of the southwestern form (*C. acuta*), including the type, not more than half have the ovate acute sepals on which the species was based, although they do show diagnostic and constant characters in the shape and toothing of their leaves. In fact, the variation in sepal-form in the seven sheets from this region (Arizona and New Mexico) is greater than that shown by all the other specimens of *C. umbellata* (*sensu lato*) which I have examined from Eurasia, North America, and Mexico.

[1] *Loxia megaplaga* Riley, Smiths. Misc. Coll. lxvi. no. 1. 15 (1916).

The specific separation of the plant of eastern North America from that of Europe, originally proposed by Alefeld and seconded by Rydberg, is based on differences of comparatively slight moment. Alefeld[1] in 1856 attempted to distinguish two species, *C. umbellata* (*sensu stricto*), from Eurasia and the Pacific coast of North America, with stigma half as broad as ovary and dull capsule broadest below the middle, and *C. corymbosa* Pursh (as to descr., not syn.), from eastern North America, with stigma three-quarters the breadth of ovary, and shiny capsule broadest above the middle. His division, however, was based on comparatively slight material from America, and I have been unable to trace such differences in the abundant material examined, although a very slight distinction in the absolute breadth of the stigma is shown by the material from the two areas. The additional features brought out in Dr. Rydberg's description of *C. umbellata* (of Europe) are merely average comparative differences of slight consequence, and in connection with two or three others indicated in the detailed descriptions given beyond are of such a character as to show that the plants are at most only varietally separable.

The following descriptive key will serve to show the diagnostic characters of the varieties of *Chimaphila umbellata.*

Leaves rather prominently veined beneath.
- Capsule 5–6 mm. in diameter.
  - Plant usually smaller (about 1.5 dm. high); leaves smaller (usually about 3.5 cm. long), blunt, not mucronulate, with fewer (4–13, usually 8–9) blunt teeth; flowers umbellate, rarely subracemose; sepals usually ovate, slightly longer than broad; stigma 1.9–2.3 mm. broad; Eurasia ..... Var. *genuina.*
  - Plant usually larger (2 dm. high or more); leaves larger (4–7 cm. long), acute or rarely obtuse, mucronulate, with more numerous (6–18, usually 10–12) sharp teeth; flowers usually more or less racemose; sepals depressed-triangular or oval, usually broader than long; stigma 2.3–2.5 mm. broad; eastern North America ..... Var. *cisatlantica.*
- Capsule 7.5–8.5 mm. thick; plant stout, 2–3.5 dm. high; leaves large (5–7 cm. long), with 7–13 acute teeth, very strongly veined beneath; flowers racemose; sepals deltoid, usually longer than broad; stigma 2.3–2.7 mm. broad; Mexico ..... Var. *mexicana.*

Leaves obscurely veined beneath.
- Plant stoutish, 1.5–3 dm. high; leaves acute, mucronulate, 3–9 cm. long, with 10–18 acute teeth extending nearly to base; flowers usually racemose, strongly rose-tinted; pedicels usually ascending; sepals depressed-deltoid, longer than broad, blunt; capsule 6–7.5 mm. thick; stigma 2.3–2.6 mm. broad; British Columbia to California ..... Var. *occidentalis.*
- Plant small, 1–1.7 dm. high; leaves usually narrowly oblanceolate, acute, mucronulate, with 4–8 teeth on each side above the middle, 3.5–5.8 cm. long; flowers racemose or subumbellate, the pedicels ascending or diverg-

[1] Alefeld, Linn. xxvii. 78–84 (1856).

ing; sepals usually ovate and longer than broad, from acuminate to rounded; capsule 5–6 mm. thick; stigma 2.6–3 mm. broad; New Mexico and Arizona..... Var. *acuta*.

CHIMAPHILA UMBELLATA (L.) Bart. Veg. Mat. Med. U. S. i. 17. t. 1 (1817); Nutt. Gen. i. 274 (1818).— *Pyrola umbellata* L. Sp. i. 396 (1753). *P. frutescens* Gilib. Fl. Lithuan. v. 195 (1782), a mere renaming of the European plant. *Chimaphila corymbosa* Pursh! Fl. Am. Sept. i. 300 (1814); Alefeld, Linnaea xxviii. 81 (1856); Rydb. in Britton, N. Am. Fl. xxix. 32 (1914). *C. occidentalis* Rydb. l. c. 30 (1914); *C. corymbosa, C. mexicana, C. acuta* Rydb. l. c. 31.

Var. **genuina**. Planta saepius humilior 1.5–2.4 dm. alta (saepissime ca. 1.5 dm.); folia cuneata apice saepissime obtusa et non mucronulata utroque 4–13 (saepissime 8–9) dentibus obtusis praedita infra paullum venosa saepius ca. 3.5 cm. (rarius usque ad 5 cm.) longa (petiolis inclusis) 0.9–1.7 cm. lata; flores saepissime 3–6 umbellati rare subracemosi, pedicellis anthesi divergentibus; sepala saepissime ovata obtusa paullo longiora quam lata plus minusve erosa et glandulari-ciliolata; capsula 5–6 mm. diametro; stigma 1.9–2.3 mm. latum.— *Pyrola umbellata* L., as to Eurasian plant. *P. frutescens* Gilib. *Chimaphila corymbosa* Pursh, as to syn. in part. *C. umbellata* Bart. as to syn. in part; Alefeld, l. c. 78, in part; Rydb. l. c.— Among the specimens examined, the following may be cited. SWEDEN: Åhus, *Kindberg* (Fries, Hb. Norm.); Westerwik, 1902, *C. Pleijel.* GERMANY: Driesen, Neumark, *Lasch* (distr. L. Reichenbach 462); pine forests near Spire, Rhenish Bavaria, 1853, *F. G. Koch* (distr. Billot 3655). AUSTRIA-HUNGARY: Weisskirchen, Bohemia, 1911, *Petrak* 661; Schleinz and Walpersbach, *Kerner* 2586; near Güns, 260 m., *Waisbecker* (distr. Kerner 2586, in part). SIBERIA: Sagalien, *Faurie* 30 & 610 (Brit. Mus.). JAPAN: Island of Yezo, *Faurie* 6791 (Brit. Mus.), *Maximowicz, Albrecht, Miyabe, Tokubuchi, Arimoto.*

Var. **cisatlantica**. Planta saepius major saepissime 1.5–2.8 dm. alta; folia cuneata vel cuneato-obovata vel cuneato-lanceolata acuta vel acutiuscula rarissime obtusa mucronulata utroque 6–18 (saepius 10–12) dentibus saepius acutis praedita (3) 4–7 cm. longa 1–2.2 cm. lata, venis infra distinctis subprominentibus; flores saepius 4–8 plus minusve racemosi rare umbellati saepius pallidi, pedicellis anthesi divergentibus vel reflexis vel non rare adscendentibus; sepala saepius depresso-triangularia vel orbicularia obtusa latiora quam longa, rare triangularia longiora quam lata et acuta vel acutiuscula rarissime ovata acuminata, glandulari-ciliolata et paullum erosa; capsula 5–6 mm. diametro; stigma 2.3–2.5 mm. diametro.— *C. corymbosa* Pursh, as to plant described, and syn. in part; Alefeld and Rydb. ll. cc.— Rimouski Co., Que., northern N. B., P. E. I., and N. S. to western Ont. and Minn., southward to Va.; also reported from Ga., but no specimens examined.— Type from NEW BRUNSWICK: dry deciduous woods, Bathurst, 15 Aug. 1913, *Blake* 5435 (in Gray Herb.). Other specimens examined: QUEBEC: vicinity of Cap-à-L'Aigle, 1905,

J. Macoun 68554, 68555; dry rocky woods, Bic, July 1904, *Collins & Fernald;* wooded crest above limestone-conglomerate cliffs and ledges, island-headland east of Baptiste Michaud's, Bic, July 1904, *Collins & Fernald.* NEW BRUNSWICK: Little Branch, Mirimichi, 1892 & 1894, *Fowler;* under small balsams in rich soil, Shediac Cape, 1914 & 1916, *Hubbard;* St. Francis Parish, July 1900, *Williams.* PRINCE EDWARDS ISLAND: dry woods, Dundee, Aug. 1912, *Fernald, Long, & St. John* 7878. NOVA SCOTIA: dry woods, near Pictou, July 1901, *Howe & Lang* 632; Smoky Mountain, Cape Breton, Aug. 1914, *Nichols* 861[1]; mountains west of Ingonish, Aug. 1914, *Nichols* 752. NEW ENGLAND: common throughout. NEW YORK: Stony Creek Ponds, Adirondack Mts., July 1899, *Rowlee, Wiegand, & Hastings;* rather rare, damp moist woods, Canton, July 1914, *Mrs. O. P. Phelps* 750. PENNSYLVANIA: Pocono Plateau, 1904, *Harshberger;* Pond Hill Station, Luzerne Co., 1892, *Heller & Halbach* 624. NEW JERSEY: Locust, July 1903, *Williams.* VIRGINIA: damp woods, Cherrydale, June 1913, *Tidestrom* 6353. ONTARIO: dry or rocky woods, Elgiver, June 1878, *J. Macoun* 1182; crevices of greenstone north of Speke's Point, Lake Nipigan, 1912, *H. E. Pulling;* woods near Snell's Lake, West Ontario, July 1889, *R. Lees.* MICHIGAN: common, woods, Keweenaw, July 1890, *Farwell* 343[1]; open pine woods, Hamlin Lake, Ludington, July 1910, *R. W. Chaney* 83. WISCONSIN: Kilbourn, 1861, *Hale.* MINNESOTA: Star Island, Cass Lake, 1914, *Pammel, Pammel, & McNutt.*— In the British Museum are specimens from "Massachusetts," *Nuttall,* and "North America," *Pursh.*

Var. MEXICANA DC. Planta valida 2–3.5 dm. alta; folia cuneato-lanceolata vel cuneato-obovata acuta mucronulata utroque 7–13 dentibus acutis praedita (3.8) 5–7 cm. longa 0.8–2 cm. lata infra valde venosa; flores 4–7 racemosi, pedicellis anthesi adscendentibus vel suberectis; sepala depresso-deltoidea vel deltoidea saepius longiora quam lata ciliolata et erosa obtusissima vel acutiuscula; capsula 7.5–8.5 mm. diametro; stigma 2.3–3.7 mm. latum.— DC.! Prod. vii. 775 (1839). *C. mexicana* (DC.) Rydb. in Britton, N. Am. Fl. xxix. 31 (1914).— Southern Mexico.— VERA CRUZ: vacqueria del Jacal, Mt. Orizaba, 3050 m., Sept. 1841, *Liebmann.* STATE OF MEXICO: forest at San Nicolas, Sept. 1865–66, *Bourgeau* 1002; near Mexico City, 1827, *Berlandier* 605 (TYPE COLL.: hb. Prod., Brit. Mus.); mountains near Mexico City, 1856, *Schmitz* 555 (Brit. Mus.); shady woods, Ixtaccihuatl, 2745–3050 m., Nov. 1905, *Purpus* 1765. CHIAPAS: 1864–70, *Ghiesbreght* 114 & 647; near San Cristobal, 2135–2685 m., Sept. 1905, *E. W. Nelson* 3204.

Var. **occidentalis** (Rydb.) Planta saepius valida 1.5–3 dm. alta; folia cuneata vel cuneato-obovata acuta mucronulata utroque 10–18 (saepius 11–13) dentibus acutis praedita 2.5–9 (saepius 3–7) cm. longa 1.1–2 (2.5) cm. lata, infra obscurissime vel haud venosa; flores

[1] These specimens are remarkable for their ovate acuminate sepals.

4–9 saepius racemosi rare umbellati saturate rosei, pedicellis anthesi saepius suberectis vel adscendentibus interdum patenti-divergentibus vel plus minusve recurvatis; sepala depresso-deltoidea longiora quam lata obtusa erosa et ciliolata; capsula 6–7.5 mm. diametro; stigma 2.3–2.6 mm. diametro.— *Chimaphila occidentalis* Rydb.! in Britton, N. Am. Fl. xxix. 30 (1914).— British Columbia to Colorado, northern Utah, and the mountains of north-central California.— BRITISH COLUMBIA: Revelstoke, 490 m., July 1905, *Shaw* 821; Beaver Valley, 1100 m., Aug. 1904, *Macmillan* (distr. Shaw 530); Cowichan Lake region, Vancouver I., June 1907, *Rosendahl* 1768; Fraser River, *Wallace;* Saturna I., 1858, *Lyall;* West Kootenay, 1861, *Lyall.* WASHINGTON: foothills, Olympic Range, July 1902, *J. M. Grant* 137; slopes of Mt. Tacoma, Aug. 1904, *J. G. Jack;* near Ft. Vancouver, ——; Valley of Swank River, Twp. 17 & 18, Range 21, Kittitas Co., 750–1800 m., 1913, *S. P. Sharples* 174; Peshatin, Okanogan Co., 425 m., July 1893, *Sandberg & Leiberg* 565; Mt. Carleton, July 1902, *F. O. Kreager* 179; Blue Mts., July 1897, *R. M. Horner* 1168; without definite locality, 1889, *Vasey* 372. OREGON: Calapooya Valley, Douglas Co., 1065 m., July 1899, *M. A. Barber* 147a; Mt. Scott, July 1899, *Barber* 41; without definite locality, 1871, *E. Hall* 355. CALIFORNIA: Mt. Shasta, 1860–62, *Brewer* 1403; l. c., 1830 m., Aug. 1903, *Copeland* (distr. Baker 3828); Hupa Indian Res., 150 m., June 1901, *Chandler* 1398; foothills south of Mt. Sanhedrin, midway between Potter Valley and Hullville, Lake Co., July 1902, *Heller* 4935; Mendocino Co., 1867, *Bolander* 6543; Sierra Valley, *Lemmon;* mounts of eastern Butte Co., 1878, ——. IDAHO: slopes of Wiesner's Peak, 1650 m., July 1895, *Leiberg* 1344; valley of Pine Creek, near Farmington, Latah Co., June 1892, *Sandberg, MacDougall, & Heller* 519 (TYPE COLL. of *C. occidentalis*); 1280 m., Tamarack, Washington Co., Aug. 1911, *June A. Clark* 167; 1370 m., Trinity, Elmore Co., Aug. 1910, *Macbride* 550. UTAH: Uintas, 2135 m., July 1869, *Watson* 746. MONTANA: Big Fork, vicinity of Flathead Lake, July 1908, *Mrs. Joseph Clemens;* Granite Canyon near Missoula, Aug. 1880, *Watson* 256; Emigrant Gulch, 1980 m., Aug. 1897, *Rydberg & Bessey* 4651. COLORADO: headwaters of Clear Creek, and alpine ridges lying east of Middle Park, 1861, *Parry.* WYOMING: Jackson's Hole, Aug. 1894, *A. Nelson* 946; near Leigh's Lake, July 1901, *Merrill & Wilcox* 1119; Laramie River, along Medicine Bow Mts., *H. Engelmann;* Laramie Peak, Aug. 1895, *A. Nelson* 1616.

Var. **acuta** (Rydb.) Planta minor 1–1.7 dm. alta; folia saepius anguste oblanceolata acuta mucronulata utroque supra medium 4–8 (saepius 5–6) dentibus acutis vel obtusiusculis praedita, 3.5–5.8 cm. longa 0.9–1.2(1.5) cm. lata, venis obscurissimis vel rare parum prominentibus; flores 3–5 racemosi rare subumbellati, pedicellis anthesi adscendentibus vel divergentibus; sepala saepius ovata longiora quam lata interdum suborbicularia, apice acuta vel acuminata vel non rare obtusa sive rotundata glandulari-ciliolata et erosa;

capsula 5–6 mm. diametro; stigma 2.6–3 mm. diametro.— *Chimaphila acuta* Rydb.! in Britton, N. Am. Fl. xxix. 31 (1914).— New Mexico and Arizona.— NEW MEXICO: Black Horse Ridge, Baldy Mtn., near Elizabethtown, 3050 m., Oct. 1898, *Mrs. O. St. John* (U. S. Nat. Herb.); Mogollon Mts., Socorro Co., Aug. 1900, *Wooton* (U. S. Nat. Herb.); near West Fork of Gila R., Mogollon Mts., Socorro Co., 2625 m., Aug. 1903, *Metcalfe* 572 (U. S. Nat. Herb.). ARIZONA: rich soil, San Francisco Mts., near Flagstaff, July 1891, *McDougal* 480 (U. S. Nat. Herb.); dry woods, near Partridge Spring, San Francisco Mts. Forest Reservation, 2000 m., July 1901, *Leiberg* 5679 (U. S. Nat. Herb.); top of "Rim-rock," Tanto Basin, 2 Aug. 1887, *Mearns* 136 (TYPE in herb. N. Y. Bot. Gard.).

Our southwestern form of *Chimaphila* was distinguished by Dr. Rydberg under the name *C. acuta*, and separated in his key by its sepals "longer then broad, acute" from all its relatives of the *C. umbellata* alliance. There is no material of *Chimaphila* from Arizona and New Mexico, the area assigned to *C. acuta* by Rydberg, in the Gray Herbarium, but through the courtesy of Dr. N. L. Britton and Mr. W. R. Maxon I have been able to examine the type sheet of *C. acuta* in the herbarium of the New York Botanic Garden and six other sheets from this region in the National Herbarium. Examination of these specimens shows that the sharply pointed sepals upon which Dr. Rydberg relied in separating *C. acuta* are not a constant feature, although sometimes strikingly developed. They vary, even in the same specimen, from acute or acuminate to obtuse, and in shape, while usually ovate and distinctly longer than broad, are sometimes suborbicular, bluntly round-tipped, and quite indistinguishable from the ordinary form of eastern or western specimens. The material examined is divided nearly equally into groups with obtuse and with acute sepals, so that the character on which the species was based can hardly be considered of sufficient constancy for use in differentiation. It is not too much to say that more variation is shown by the seven sheets of this form examined, in respect to the character of the sepals, than by all the other material of *C. umbellata* which I have seen. But although the isolation of this form has failed to fix a uniform and distinctive type of sepal upon it, it has resulted in the development of a characteristic leaf. In all the other American forms the usually broader leaves bear a noticeably greater number of teeth which extend below the middle or almost to the base of the lamina.

GRAY HERBARIUM.

ADDITIONS TO THE FLORA OF CONNECTICUT.

(*Continued from page 232.*)

Sanicula gregaria Bicknell. Occurs westward to North Canaan (A. E. Blewitt), Cornwall (Harger), and Salisbury (Mrs. C. S. Phelps).

S. trifoliata Bicknell. Cheshire (A. E. Blewitt), Danbury (Harger).

* Osmorhiza longistylis (Torr.) DC., var. villicaulis Fernald. Rich woods and fence-rows: Waterbury (A. E. Blewitt), Sharon, Southbury, Oxford and Milford (Harger). Probably frequent in southwestern Connecticut.

Aegopodium Podagraria L. Waterbury (A. E. Blewitt), Salisbury (A. E. Blewitt & Harger). Both of the above stations are of the form with variegated leaves; the form with unspotted leaves has been found at Bridgeport (Eames).

* Sium cicutaefolium Schrank, var. Carsonii (Durand) Eames. Rhodora, xviii. 237 (1916). Occasional to frequent in the southern part of the state.

† Apium graveolens L. Celery. Waste ground in Bridgeport (Eames). Fugitive from Europe.

Taenidia integerrima (L.) Drude. Haddam (C. M. Child; specimen in Herb. Wesleyan University). New Milford (Bissell). Not previously reported from the Connecticut valley.

† Anthriscus Cerefolium (L.) Hoffm. A weed in gardens, Salisbury (Mrs. J. R. Sanford, Rhodora, xvi. 96). Adventive from Europe.

† Heracleum Sphondylium L. A small clump, persistent since 1910 at least, at Bridgeport (Eames). Fugitive or adventive from Europe.

Cornus stolonifera Michx. Redding (A. H. Graves), Moses Mt., Danbury (A. H. Graves & Harger). Not previously reported south of New Milford.

† Calluna vulgaris (L.) Hull. Heather. Ling. A single plant in dry woods at Woodbury (E. M. Stoddard) and one in a similar situation at Salisbury (Mrs. Donald T. Warner). Pines from European nurseries have been used for forest planting near each of these two stations, which may account for the introduction of the plant, although at neither place was it found among the pines as planted.

Ledum groenlandicum Oeder. Windham (Bissell & Weatherby); sphagnum bog near Congamond Lake, Suffield (Harger).

Rhododendron canadense (L.) BSP. Winchester and Salisbury (Mrs. C. S. Phelps). Not previously reported from Litchfield Co.

Arctostaphylos Uva-ursi (L.) Spreng. Windsor and Salisbury (Mrs. C. S. Phelps). Not previously reported from Litchfield Co.

Chiogenes hispidula (L.) Torr. & Gray. New Fairfield (A. H. Graves & Harger). In the Catalogue not reported from Fairfield Co.

Vaccinium stamineum L. Haddam (Weatherby), Burlington (Miss Julia F. White). Not previously reported east of Waterbury.

The fruit of this species is usually rated as inedible or at most tart. There are times, at least, when it attains a diameter of 1.8 cm., becomes juicy, sweet or somewhat acidulous and slightly fragrant, the translucent skin roseate or blushed.— E. H. Eames.

* V. vacillans Kalm, var. crinitum Fernald. Rhodora, xiii. 236 (1911). Glastonbury (Mrs. F. W. Starmer).

* V. corymbosum L., var. pallidum (Ait.) Gray. In a swamp near the shore at Stonington (Harger).

Lysimachia vulgaris L. Ridgefield and Danbury (A. H. Graves, Harger and R. W. Woodward). This species is occasional and thoroughly wild in roadsides, wet fields and damp thickets for some two miles along a valley.

† L. producta (Gray) Fernald. Waterbury (A. E. Blewitt & Harger). Not previously reported in New Haven Co.

Steironema lanceolatum (Walt.) Gray. Thompson (Weatherby), Plainfield (Bissell, Harger and R. W. Woodward). Not previously reported from Windham Co.

Diospyros virginiana L. This species is not limited to the grove on the beach at Lighthouse Point. Much larger trees, some of them nearly 30 ft. tall, occur in the rocky woods west of the trolley line. These trees appear native and, because of their size, older than those by the beach.— E. H. Eames.

Acerates viridiflora Ell., var. lanceolata (Ives) Gray. East Haven (O. Harger, 1885), New Haven at the type station (Harger), Oxford (Harger).

Convolvulus spithamaeus L. Glastonbury (Mrs. F. W. Starmer), Orange (Harger), Stamford (W. H. Hoyt). Eastward and southward extensions of range.

C. japonicus Thunb. Greenwich (W. H. Hoyt), Bridgeport (A. E. Blewitt).

* Cuscuta obtusiflora HBK. Rare. Shores of the Connecticut, Housatonic and Pomperaug Rivers: Windsor (G. E. Nichols), Southbury (Harger, Rhodora, xv. 66). Newtown (Bissell & Harger), Huntington (Harger & Weatherby).

C. compacta Juss. Killingly (Weatherby). Not previously reported from Windham Co.

Phlox pilosa L. Sandy roadside, Southbury, at a locality about a mile distant from the station noted in the Catalogue.

† Polemonium reptans L. Escaped from cultivation in Easton (Eames).

Cynoglossum officinale L. Stamford, at several stations (W. H. Hoyt), Naugatuck and Waterbury (A. E. Blewitt).

* C. virginianum L. Rare. Killingworth (F. W. Hall, 1874; specimen in Herb. Conn. Agr. Exp. Sta.), Stamford, rocky woods at several places (W. H. Hoyt).

C. boreale Fernald. Guilford (W. R. Dudley; specimen in Herb. Yale University).

Myosotis arvensis (L.) Hill. Southington (Andrews).

Symphytum asperum Lepechin. *S. asperrimum* Donn. Greenwich (Bissell & Weatherby).

† Phacelia linearis (Pursh) Heller. Spontaneous in newly seeded grass-land, with *Clarkia*, Windsor (C. R. Hathaway). Fugitive from the northwestern United States.

† Onosmodium occidentale Mackenzie. Waste ground, Naugatuck (A. E. Blewitt, Rhodora, xiv. 163). Fugitive from the West.

Verbena angustifolia Michx. Cromwell (M. Hitchcock, 1881; specimen in Herb. Wesleyan University). In the Catalogue not reported from the Connecticut valley.

Scutellaria parvula Michx., var. ambigua (Nutt.) Fernald. North Branford (W. R. Dudley, Harger).

Agastache nepetoides (L.) Ktze. Frequent in Stamford and Greenwich (W. H. Hoyt).

A. scrophulariaefolia (Willd.) Ktze., var. mollis (Fernald) Heller. Thomaston (A. J. Hill), Woodbury (Eames & C. C. Godfrey).

Dracocephalum parviflorum Nutt. Waste ground and cultivated fields: Waterbury and Barkhamsted (A. E. Blewitt), Bridgeport (Eames), Stamford (W. H. Hoyt).

Galeopsis Ladanum L., var. latifolia (Hoffm.) Wallr. The Catalogue report of *G. Ladanum* was based on a specimen of this variety.

Lamium hybridum Vill. Fairfield (Eames).

† Salvia verticillata L. Waste ground, Naugatuck (A. E. Blewitt). Fugitive from Europe.

S. officinalis L. Glastonbury (C. C. Hanmer).

Monarda clinopodia L. Fairfield (Eames).

† Antirrhinum majus L. Snapdragon. Rare. Waste ground, Bridgeport (Eames). Fugitive from Europe.

Mimulus alatus Ait. Middletown (A. E. Blewitt), Chester (Harger), Guilford (W. R. Dudley; specimen in Herb. Yale University).

Limosella aquatica L., var. tenuifolia (Wolf) Pers. Shore of Lake Saltonstall, Branford (R. W. Woodward). Previously reported only from tidal shores.

Ilysanthes anagallidea (Michx.) Robinson. Groton (Bissell), Plainfield (Harger). Not previously reported from eastern Connecticut.

† Digitalis ambigua Murr. Foxglove. Waste ground, East Lyme (Mrs. F. H. Dart). Fugitive from Europe.

* Veronica Anagallis-aquatica L. Water Speedwell. Ditch by railroad track, North Canaan (Weatherby, Rhodora, xiii. 32).

V. Teucrium L. Canaan (A. E. Blewitt), Huntington and Bridgeport (Eames).

V. Tournefortii C. G. Gmel. Southington (Andrews).

* Pedicularis canadensis L., forma praeclara A. H. Moore. Rhodora xvi. 128 (1914). This red-flowered form is occasional to frequent with the species throughout.

Utricularia clandestina Nutt. Cromwell (E. J. Thompson, Rhodora, xiii. 78), South Windsor (C. W. Vibert). In the Catalogue reported only from near the coast.

U. resupinata B. D. Greene. Poquonnoc Lake, Groton (T. E. Hazen).

† Sherardia arvensis L. Rare. Well established in a lawn, New Haven (A. H. Graves). Adventive from Europe.

Galium Mollugo L. Occasional throughout western Connecticut.

G. erectum Huds. Old Lyme (Graves).

* Mitchella repens L., forma leucocarpa Bissell. Rhodora, xiii. 32 (1911). Windsor and Simsbury (Miss B. C. Hitchcock), Canaan and Cornwall (Miss M. J. Whitney).

† Lonicera Morrowi Gray. Established along a fence-row, Cromwell (Mrs. S. V. Hubbard). Adventive from eastern Asia.

L. TATARICA L. Cheshire (A. E. Blewitt), Naugatuck (Harger).

L. CANADENSIS Marsh. Windsor (Weatherby), Guilford (W. R. Dudley), Redding (Eames & C. C. Godfrey).

LINNAEA BOREALIS L., var. AMERICANA (Forbes) Rehder. Cromwell (E. J. Thompson, RHODORA, xiii. 78), Salisbury (Mrs. C. S. Phelps).

† VIBURNUM LANTANA L. Established on a roadside, Fairfield (Eames). Introduced from Eurasia.

† VIBURNUM OPULUS L. A quantity along a roadside, Westport (Eames). Introduced from Europe.

* SAMBUCUS RACEMOSA L., forma CHRYSOCARPA Eames & Godfrey ex E. H. Eames. RHODORA, xviii. 239 (1916). Rocky slopes of Quonnipaug Mt., Guilford (Eames & C. C. Godfrey).

KNAUTIA ARVENSIS (L.) T. Coulter. Abundant in a field, Litchfield (A. E. Blewitt). Eastford, well established and spreading to fields and swamps (Mrs. Geo. H. Bosworth).

* CAMPANULA ULIGINOSA Rydb. Open swamps: Litchfield (W. Buell), Sharon (Bissell).

EUPATORIUM SESSILIFOLIUM L. Cheshire, Waterbury and Thomaston (A. E. Blewitt).

E. AROMATICUM L. Saybrook at Deep River (Weatherby). In the Catalogue not reported from Middlesex Co.

GRINDELIA SQUARROSA (Pursh) Dunal. South Windsor (C. W. Vibert); several plants in dry field, Oxford (Harger).

† G. LANCEOLATA Nutt. One robust plant by a roadside, Greenwich (W. H. Hoyt). Fugitive from the southwestern United States.

CHRYSOPSIS FALCATA (Pursh) Ell. North Haven at Montowese (R. W. Woodward & A. E. Blewitt), Naugatuck (A. E. Blewitt).

SOLIDAGO SQUARROSA Muhl. Southward in western Connecticut to New Milford (Eames).

S. CANADENSIS L. Middletown (J. Barratt), New Hartford (Bissell, RHODORA, xiii. 32). In the Catalogue reported only from Lyme.

* S. CANADENSIS L., var. HARGERI Fernald. RHODORA xvii. 11 (1915). Rare. Valleys of the Connecticut and Housatonic Rivers: Middletown (J. Barratt), Lyme, Oxford, Southbury and Canaan (Harger). Distinguished from *S. canadensis* by the short-villous stem and panicle. At Lyme the species and variety grow together and completely intergrade.

S. ASPERULA Desf. Occurs in southwestern Connecticut commonly where *S. sempervirens* and *S. rugosa* grow together.

Boltonia asteroides (L.) L'Hér. Bridgeport and Fairfield (Eames), Stamford (W. H. Hoyt).

† Callistephus chinensis (L.) Cass. China Aster. Waste ground: Hartford (H. S. Clark), Southington (Andrews). Fugitive from eastern Asia.

Aster divaricatus L. The forms which have been described as *A. carmesinus* Burgess and *A. persaliens* Burgess are frequent or occasional in open woodland throughout.

A. Herveyi Gray. Killingworth (F. W. Hall), Southington (Andrews).

A. spectabilis Ait. Killingworth (F. W. Hall, 1879). In the Catalogue reported only from New London Co.

A. radula Ait. Guilford (J. Barratt), Ellington (F. N. Pease), South Windsor (Bissell).

A. Lowrieanus Porter. Cheshire (Bissell & A. E. Blewitt, Rhodora, xiii. 32). Occasional in Fairfield Co. (Eames).

A. laevis L., var. amplifolius Porter. Old Lyme (Graves), Cromwell (J. Barratt), New Haven (G. E. Nichols), Milford (Harger).

A. amethystinus Nutt. Guilford (W. R. Dudley; specimen in Herb. Yale University).

A. dumosus L. Milford (Harger). Not previously reported west of Southington.

A. Tradescanti L. Southbury (Bissell) and occasional in southwestern Connecticut (Eames).

A. longifolius Lam. Suffield (Eames & C. C. Godfrey), Enfield (Bissell & R. W. Woodward, Rhodora, xiii. 33). In the Catalogue not reported from the Connecticut valley.

A. infirmus Michx. Stamford (Eames & W. H. Hoyt).

* A. ptarmicoides Torr. & Gray. Plentiful at one locality in limestone soil at Salisbury (Eames & C. C. Godfrey, Rhodora, xvi. 20).

* Erigeron ramosus (Walt.) BSP., var. septentrionalis Fernald & Wiegand. Rhodora, xv. 60 (1913). Middlebury (W. M. Shepardson), Greenwich (Cushman & Sanford).

* E. pusillus Nutt. Sandy roadside, Voluntown (J. F. Collins & M. L. Fernald); Bridgeport (Eames). For description see Rhodora, xv. 207.

Pluchea camphorata (L.) DC. Many plants in waste ground at Waterbury (A. E. Blewitt).

* Antennaria occidentalis Greene. Rare. Glastonbury (Weatherby), roadside at Barkhamsted (Harger).

Gnaphalium purpureum L. Portland (Bissell & R. W. Woodward, Rhodora xiii. 33), Middletown (J. Barratt, 1839), Oxford (Harger). In the Catalogue reported only from New London Co.

† Parthenium Hysterophorus L. One plant in waste ground at Bridgeport (Eames). Fugitive from the southern United States.

† Ambrosia psilostachya DC. Roadsides: Stratford and Bridgeport (H. S. Clark, Rhodora, xiii. 33). Fugitive or adventive from the western United States.

Helianthus grosse-serratus Martens. Waterbury (A. E. Blewitt), Huntington (Eames). In the Catalogue reported as apparently native at Newington. Since that time, however, another western species, *Bidens aristosa*, has been found in the same field, and it seems more likely that both were introduced and have become established.

H. tracheliifolius Mill. Open woods near Moosup Pond, Plainfield (Harger). Previously reported only from New Haven.

Coreopsis lanceolata L. Abundant in a dry field, Glastonbury (Weatherby), Bridgeport and Fairfield (Eames).

† C. grandiflora Hogg. Escaped from cultivation to waste ground, Bridgeport (Eames). Adventive from the southwestern United States.

† C. pubescens Ell., var. robusta Gray in herb. ex E. H. Eames. Rhodora, xviii. 239 (1916). Waste ground, Bridgeport (Eames, l. c.). Adventive from the southern United States.

* Bidens vulgata Greene, var. puberula Wiegand. Rare. Roadside, Naugatuck, perhaps introduced; and on the Connecticut River meadows at Rocky Hill, apparently native (Harger).

B. connata Muhl. Stonington (Harger), Waterbury (A. E. Blewitt), Newtown (Bissell & Harger). A form with ray-flowers occurs at Branford (Harger).

B. laevis (L.) BSP. Franklin (R. W. Woodward, Rhodora, xv. 95). In the Catalogue not reported east of the Connecticut valley.

B. trichosperma (Michx.) Britton. Glastonbury (Mrs. F. W. Starmer), Hartford (H. S. Clark). The only previous record was based on an old collection at New Haven by O. Harger — a station long since destroyed.

B. aristosa (Michx.) Britton. Moist ground in an old field, Newington (Mrs. C. S. Phelps).

* B. aristosa (Michx.) Britton, var. mutica (Gray) Gattinger. Old fields and waste places: Windham (Graves; in the Catalogue

referred to *B. aristosa*), Newington, with the typical form (Mrs. C. S. Phelps), Bloomfield (Weatherby). Fugitive or adventive from the western United States.

Helenium nudiflorum Nutt. South Windsor (C. W. Vibert), Granby (I. Holcomb), Waterbury (B. B. Bristol), Middlebury (A. E. Blewitt & Harger).

Achillea lanulosa Nutt. Waterbury (A. E. Blewitt).

† A. Ptarmica L. A double-flowered form has been collected about an old cellar, Beacon Falls (A. E. Blewitt, Rhodora, xiv. 164). Waste ground, Fairfield (Eames). Fugitive from Europe.

Matricaria suaveolens (Pursh) Buchenau. Cromwell and Oxford (Harger). At Cromwell a widely spread and persistent weed.

† Chrysanthemum segetum L. Rare. In an abandoned garden, Oxford (Harger). Fugitive from Europe.

Artemisia Stelleriana Bess. Extends westward on sea-beaches to Madison; also in Milford (Eames).

† A. gnaphalodes Nutt. A small but vigorous colony in waste ground by a roadside, East Windsor (Weatherby). Adventive from the western United States.

Cacalia suaveolens L. Bank of the Housatonic River at Oxford (Harger).

† Arctium tomentosum Mill. Waste ground, Naugatuck (A. E. Blewitt, Rhodora, xii. 45). Adventive from Europe.

† A. nemorosum Lejeune. Waste ground: Waterbury (A. E. Blewitt), Huntington (Harger). Occasional in southwestern Connecticut (Eames). Adventive or naturalized from Europe.

† Carduus nutans L. Spontaneous in a garden, Ledyard (Graves). Fugitive from Europe.

C. acanthoides L. Simsbury (specimen in the Shurtleff Herbarium at Wesleyan University; no collector given).

Cirsium arvense (L.) Scop., var. integrifolium Wimm. & Grab. Well established in a field, Fairfield (Eames).

† Onopordon Acanthium L. An ornamental pest at one place in Fairfield (Eames).

† Silybum Marianum (L.) Gaertn. Persistent in a garden, New Milford (E. H. Austin). Fugitive from Europe.

Centaurea Jacea L. Monroe (Harger). At this station this species and its var. *lacera* grow in company with *C. nigra* and its var. *radiata* and the four forms appear to intergrade (Harger). A similar station at Bridgeport — but no *C. nigra*, var. *radiata* (Eames).

† C. AMARA L. In grass-land, Fairfield (Eames). Adventive from Europe.

C. MACULOSA Lam. Plainfield (Mrs. Henry Dorrance), Oxford (Alfred P. Harger), Middlebury and New Fairfield (A. E. Blewitt), Kent (H. Mosher).

C. VOCHINENSIS Bernh. Ledyard (B. T. Avery, Graves), Cheshire (A. E. Blewitt).

† CNICUS BENEDICTUS L. Accidental in a garden, Kent (Miss J. F. Gregory). Fugitive from Europe.

KRIGIA AMPLEXICAULIS Nutt. Moist field at two stations, Danbury (Harger). Occasional at Stamford (W. H. Hoyt).

PICRIS ECHIOIDES L. In newly seeded grass-land, Milford (Harger).

SONCHUS ARVENSIS L. Southbury (Harger).

LACTUCA SCARIOLA L. Waterbury (A. E. Blewitt).

L. INTEGRIFOLIA Bigel. Manchester (Bissell), Middletown (J. Barratt, 1838), Torrington (Bissell & Weatherby), Stratford and Beacon Falls (A. E. Blewitt), Stamford (W. H. Hoyt), East Hartford and probably Salisbury (Weatherby). In the Salisbury plant the leaves have the characteristic oblanceolate outline of *L. integrifolia* but are entire.

CREPIS TECTORUM L. Kent (H. Mosher).

PRENANTHES ALTISSIMA L., var. HISPIDULA Fernald. Plentiful in moist woods by Salmon River, Colchester (Harger).

HIERACIUM PILOSELLA L. Oxford, a small colony (Harger), Fairfield, a considerable area (Eames).

H. FLORENTINUM All. Fields and roadsides at two stations, Salisbury (Harger, Weatherby). Introduced from Europe.

H. PRATENSE Tausch. Occasional over most of the state. A teratological form with the corollas all tubular or with very short ligules is abundant in two fields about half a mile apart in Durham (Weatherby). All the plants in both fields are of this form.

H. MARIANUM Willd. Beacon Falls (Harger), Westport (Eames).

E. B. HARGER,
C. B. GRAVES,
E. H. EAMES,
C. H. BISSELL,
L. ANDREWS,
C. A. WEATHERBY.

THE BOREAL AND SUBALPINE VARIETY OF SPIRAEA LATIFOLIA.

M. L. Fernald.

Spiraea latifolia (Ait.) Borkh., as it occurs through most of its range, has the leading or primary inflorescence pyramidal-paniculate, the lower branches of the panicle being distinctly elongate. Its secondary inflorescences are less pyramidal in outline and are often subcylindric or ellipsoid; but all well-developed or uninjured specimens show the characteristic pyramidal terminal or primary panicle.

In Newfoundland and eastern Saguenay County, Quebec, however, *S. latifolia* departs from the more widely distributed shrub with pyramidal primary panicles in having all the panicles of a cylindric or subcylindric form, the lower branches of the inflorescence scarcely if at all exceeding the subtending leafy bracts; and the only collection from the Magdalen Islands, although somewhat transitional, is nearer the Newfoundland shrub than to the widely distributed shrub of the mainland.

In 1915, while collecting on the Franconia Range of the White Mountains the writer was impressed by the similarity of the subalpine form of *Spiraea latifolia* to the shrub of Newfoundland, and during the past summer, while exploring Huntington's Ravine and the Alpine Garden of Mt. Washington with Professors A. W. Evans and A. S. Pease, he was again struck with the strong resemblance of the subalpine and alpine shrub with the Newfoundland plant and its pronounced departure from the lowland *S. latifolia.*

Examination of all the material in the Gray Herbarium and the herbarium of the New England Botanical Club shows these field-impressions to have been well founded; for the alpine and subalpine specimens, from Mt. Katahdin, Maine, and the Carter, Presidential and Franconia Ranges of New Hampshire, agree with the Newfoundland specimens in their cylindric or subcylindric primary panicles. On many of the specimens, from all three areas, the flowers are somewhat larger than in much of the pyramidal-panicled shrub of lower latitudes or altitudes, but some specimens from low altitudes in New England show quite as large flowers. As geographic varieties, differing primarily in the form of the primary panicle, the two are well

defined. From the original description of *S. salicifolia, γ latifolia* Ait., "racemis paniculatis," upon which *S. latifolia* (Ait.) Borkh. was based, it is apparent that Aiton was describing the common plant with definitely paniculate inflorescences. The two varieties of the species may therefore be designated

SPIRAEA LATIFOLIA, var. **typica**. *S. salicifolia, γ latifolia* Ait. Hort. Kew. ii. 198 (1789). *S. latifolia* (Ait.) Borkh. Handb. Forstbot. 1871 (1803).— Primary inflorescences pyramidal.

Var. **septentrionalis**, n. var., inflorescentiis primariis cylindricis vel subcylindricis.

Primary inflorescences cylindric or subcylindric.— NEWFOUNDLAND: roadsides, St. John's, July 31, 1894, *Robinson & Schrenk*, no. 22; sandy and gravelly banks of Waterford River between Waterford Bridge and St. John's, August 2, 1911, *Fernald & Wiegand*, no. 5663; swampy pasture, Topsail, August 12–19, 1901, *Howe & Lang*, no. 1271; bushy slopes of sandstone and arenaceous slate hills back of Carbonear, August 6 & 7, 1911, *Fernald & Wiegand*, no. 5664; ledges, talus and gravel, north bank of Exploits River, Bishop Falls, July 28, 1911, *Fernald, Wiegand and Darlington*, no. 5663; ledges and talus, north bank of Exploits, Grand Falls, July 22, 1911, *Fernald, Wiegand, Bartram and Darlington*, no. 5601 (TYPE in Gray Herb.). QUEBEC: edge of slough in the dunes, Natashquan, Saguenay Co., July 4, 1915, and September 5, 1915, *St. John*, nos. 90,522, 90,523. MAGDALEN ISLANDS: sand hills between East Cape and East Point, Coffin Island, August 17, 1912, *Fernald, Long and St. John*, no. 7562. MAINE: Depot Pond, Mt. Katahdin, July 16, 1900, *E. F. Williams*. NEW HAMPSHIRE: wall of Alpine Garden, alt. 6000 ft., Mt. Washington, August 7, 1896, and August 5, 1897, *E. F. Williams;* Lake of the Clouds, Mt. Washington, August 4, 1891, *B. L. Robinson*, no. 1002; upper slope of Alpine Garden, August 5, 1891, *B. L. Robinson;* 4½ miles up Mt. Washington Carriage Road, Sargent's Purchase, August 19, 1907, *A. S. Pease*, no. 10,543; 5 mile Sign on Carriage Road, Thompson & Meserve Purchase, August 12, 1910, *A. S. Pease*, nos. 12,832, 12,833; Fan, Huntington's Ravine, Sargent's Purchase, August 7, 1917, *Fernald & Pease*, no. 16,882; peaty soil near Imp Camp, alt. 3500 ft., Bean Purchase, August 4, 1917, *A. S. Pease*, no. 16,763; south side of Mt. John Quincy Adams at about 5000 ft., September 6, 1906, *A. S. Pease*, no. 9890; granitic gravel and peaty slopes, alpine and subalpine region of Mt. Lafayette, Franconia, July 17 and 18, 1915, *Fernald & Smiley*, no. 11,714; granitic gravel and peaty slopes, western spur of Mt. Lincoln, Franconia, August 11, 1915, *Fernald*, no. 11,716.

GRAY HERBARIUM.

NOTE ON FRUIT OF MOUNTAIN MAGNOLIA.— The writer's attention was called to a curiously misshapen fruit cone from a mountain magnolia (*Magnolia acuminata* L.). Investigation showed that the original tree, as well as others in the vicinity, bore a large quantity of similar ones. It will be remembered that the fruit of this species superficially resembles some of the larger, and more cylindrical, pine cones, and is ordinarily 3 or 4 in. in length. The abnormal fruits, for their part, were lumpy in appearance, unsymmetrical in development, corkscrew in shape, or otherwise twisted about their long axis, some resembling the head of a bird in shape, and all shorter.

With the view of ascertaining the probable cause of this abnormal development, the writer made dissections of a number of cones. No sign of insect injury, or parasitic growth was found, but on the other hand, there were evident differences in the size of the fleshy follicles composing them, accounted for by the size of the seeds within them. The abnormal fruits contained numerous ovules which had evidently never been fertilized, and the corresponding portions of the cone showed signs of atrophy. The seeds in this fruit are described as being distributed 1 or 2 in each carpel; 2 seeds were noted, but in half of the cases examined, one had never developed. These cases were interesting since there seemed to be plenty of opportunity for cross-pollination. It was apparently clear then that the distortion of the fruits was due primarily to want of complete pollination resulting in an uneven distribution of maturing seeds throughout the cone, the development of the seeds producing the mechanical force requisite.— N. M. GRIER, Central High School, St. Louis, Mo.

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